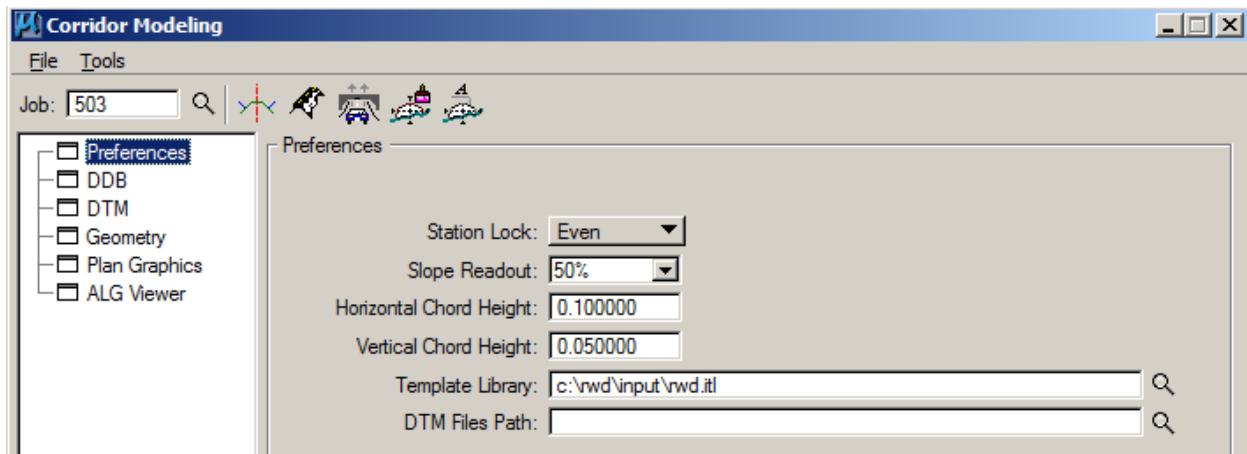



# Corridor Modeling (03-2010)



## OVERVIEW

This is Bentley's application which creates 3d models of highways. The actual model is

produced by Roadway Designer . The Corridor Modeling dialog above is used to Select a job, set preferences and identify and import Geometry, files, and Plan graphics that you will use in Roadway Designer to create a 3d model. At this time, this is GeoPak's way of getting chains/alignments stored in the GPK and Microstation plan Graphics into Roadway Designer. In a future version of GeoPak (SS3), the Corridor Modeling dialog will be going away because Roadway Designer will read Plan Graphics (Including Civil Geometry Alignments & Profiles). Possibly no import of Alignments & Profiles from the GPK.



- Create Template dialog. MDOT has created a library of templates which match our standards. C:\rwd\input\RWD.ITL is the file that contains MDOT's template library. **This file should be copied to each project directory and any templates created or modified should be created in the Project Specific folder in this file.** This is discussed more in the Template Creation chapter.



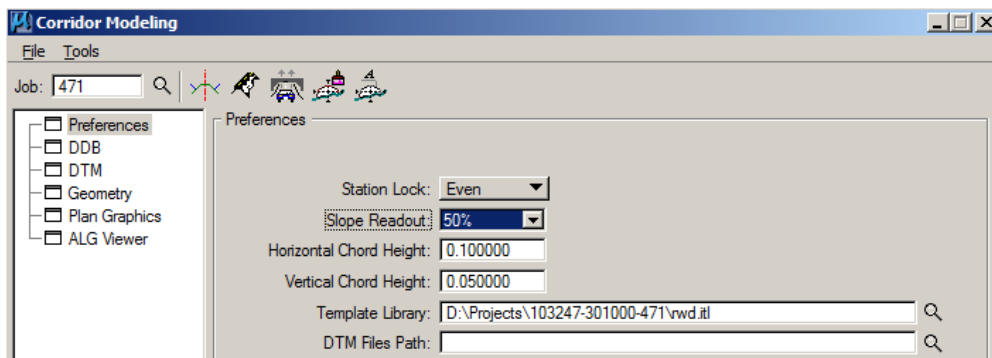
- Roadway Designer is where you create and process models for all your alignments. These are generally saved to one file per project in a \*.IRD file.



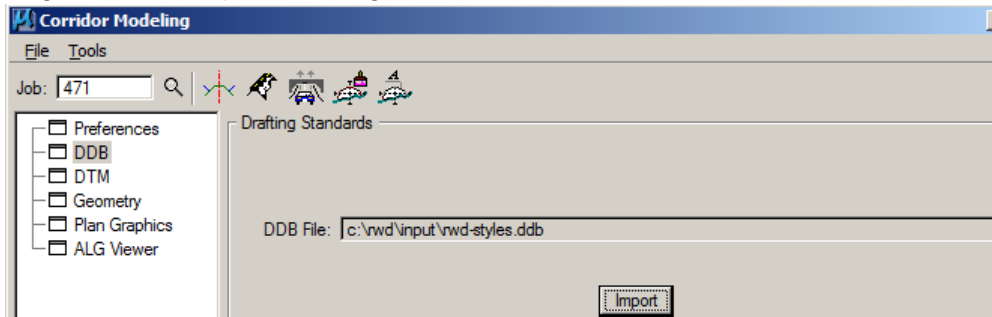
- Draw X-Sections from Surfaces creates X-Sections from Surfaces created in Roadway Designer. At this time, X-Sections are still required in plans and Earthwork should still be calculated from XS's. This may change in the future to only delivery of 3d models and surface to surface earthwork calculations.

# STEPS – Corridor Modeling Dialog

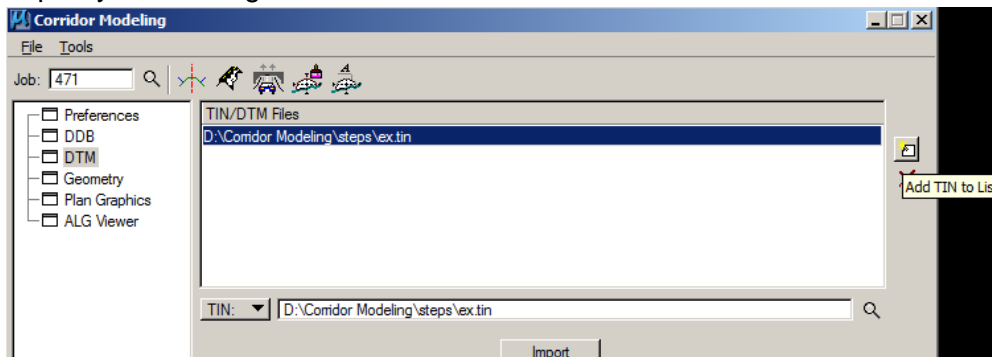
1. Copy c:\rwd\input\rwd.itl to your project directory and set the Template Library path to it.



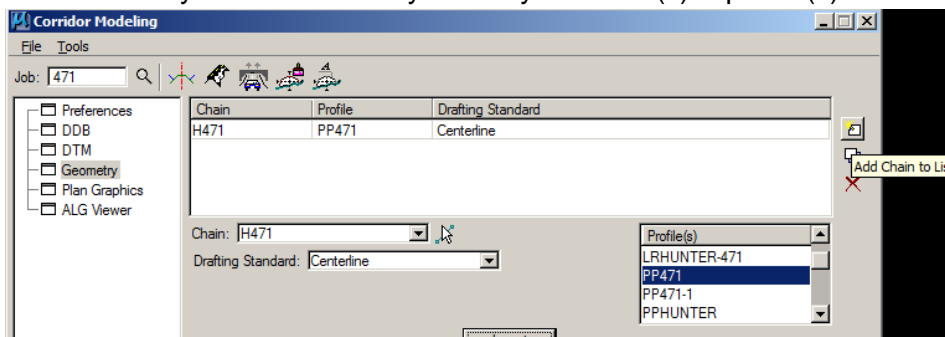
2. Tag DDB and import Drafting Standards



3. Import your existing GeoPak TIN.



4. Add Geometry – This is where you add your chain(s) & profile(s).

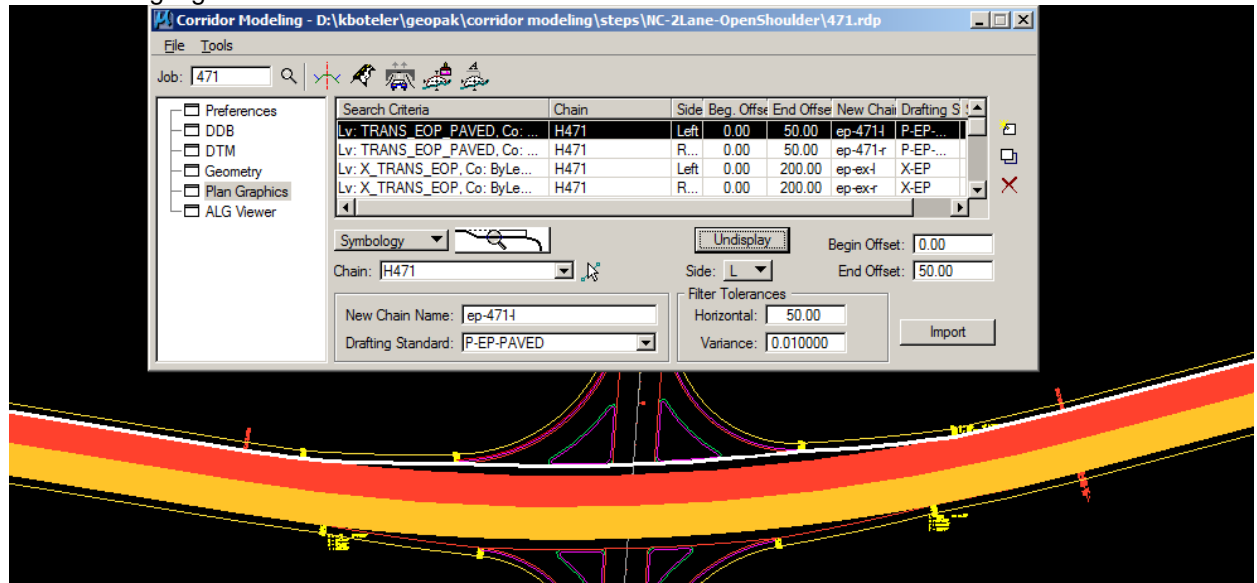


5. Plan Graphics – Plan graphics that you wish to associate with a Template point or which is to be utilized as a style constraint are imported here. Basically, you import all plan graphics which will be used by Roadway Designer.

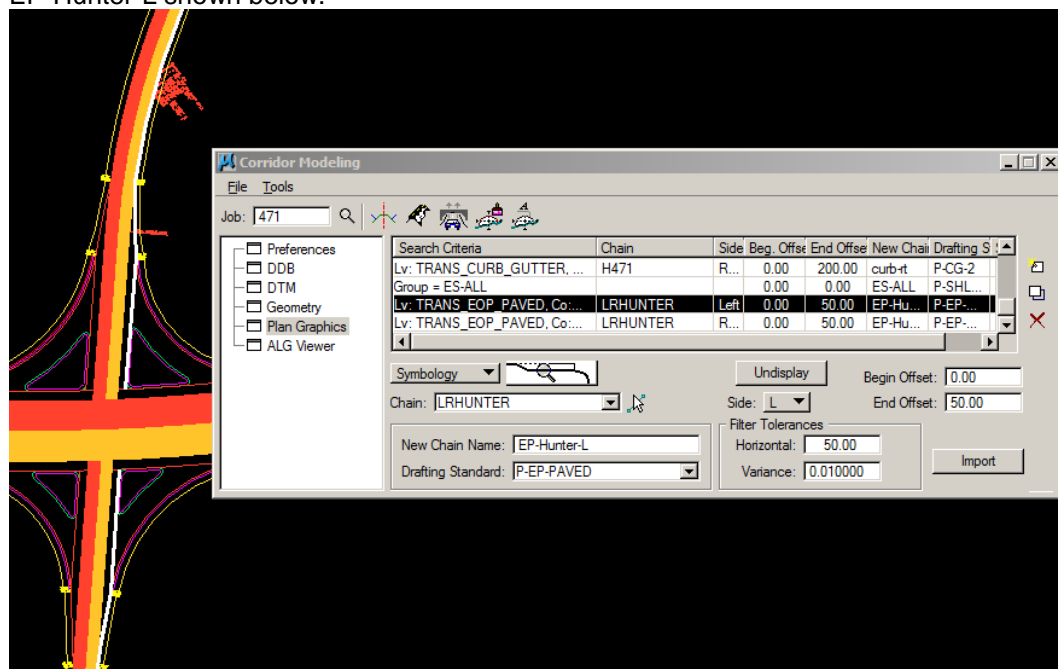
Notes:

- EP will need to be imported via Symbology for each Alignment and tied to Template Points EP-W-\* through Point Controls (Discussed later in this Help).
- EP will need to be drawn through intersections as shown below because we'll handle curb returns as their own corridor, tying to ML & LR Corridors pavement edges.

EP-471-L highlighted below

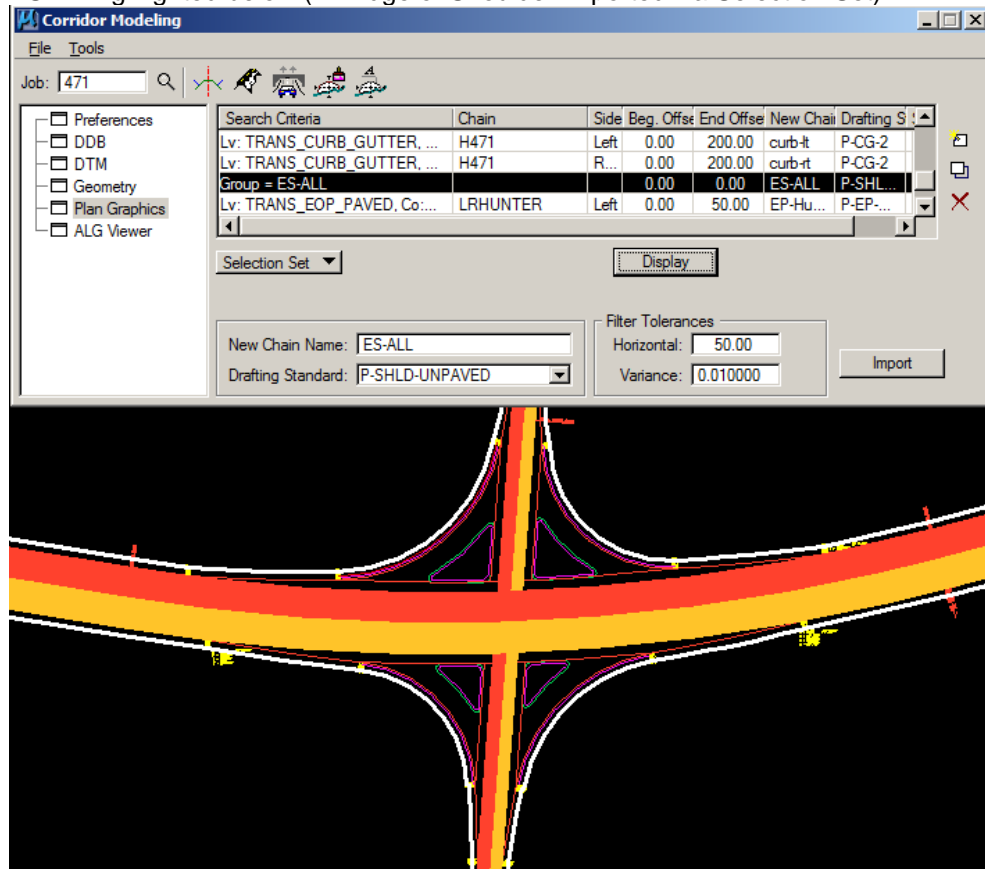


EP-Hunter-L shown below.

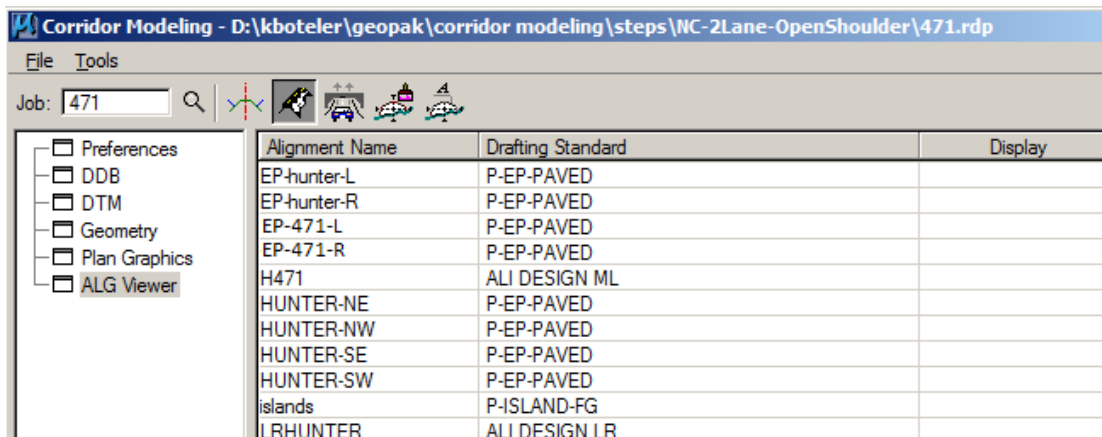


- c) Shoulder, Paved Shoulder, Face of Gutter of Island, Ex EP, Clear Zone (At Transition areas), and Sidewalk on Curb Sections are set up in the 2-lane templates to be drawn to automatically via Style Constraints meaning you don't have to associate a template point with these imported graphics. Also, you can select all elements of a specific type and import at once, not tying to a chain.

ES-All highlighted below (All Edge of Shoulder imported via Selection Set)



6. The ALG Viewer allows you to see the alignments you've imported. Don't display in your plan graphics file because elements will be added.

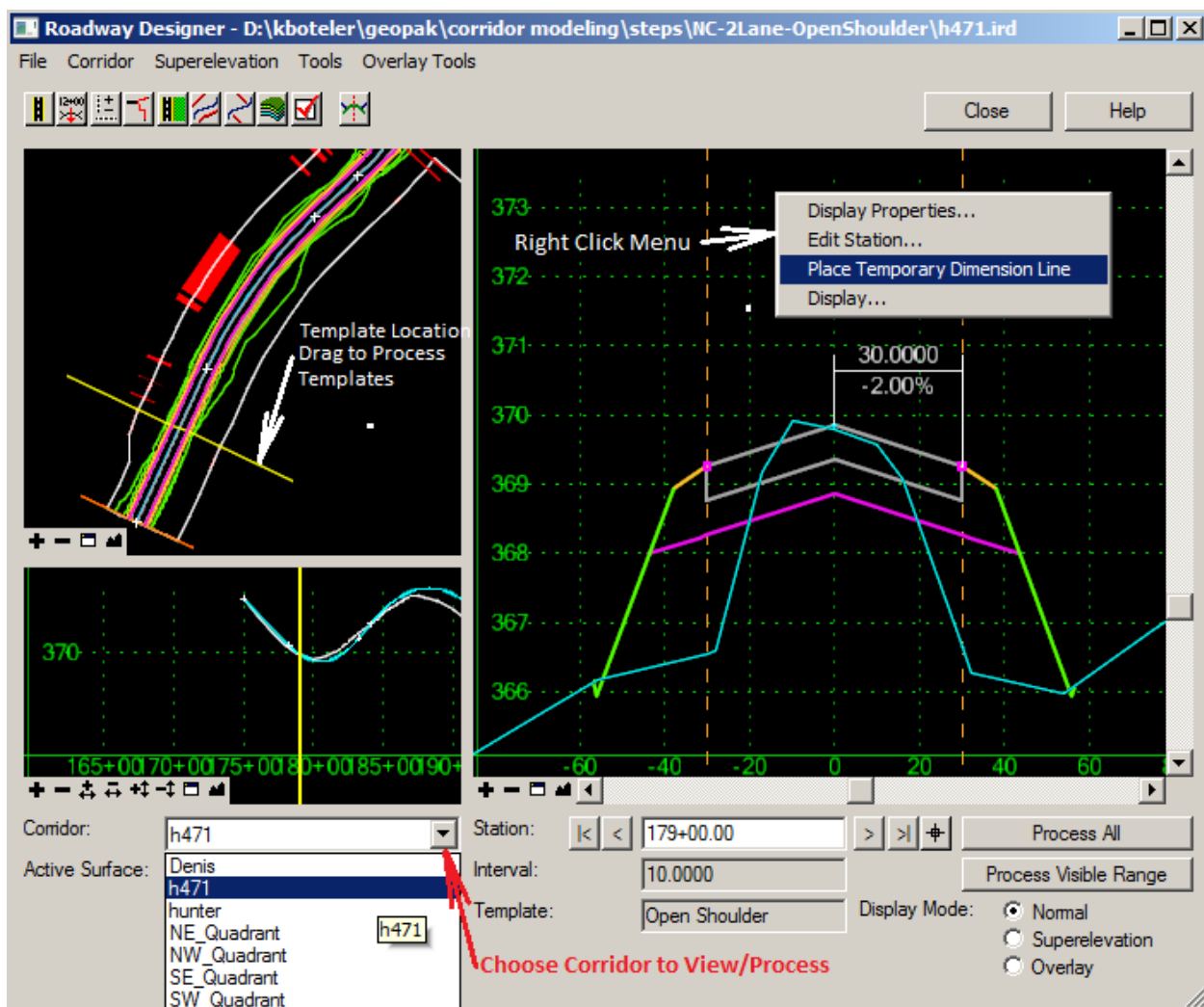


NOTE: You need to enter the DGN file containing the Plan Graphics you imported prior to invoking Corridor Modeling in subsequent sessions.

7. You need to tag File-> Save and save an RDP file which save the settings above.  
You'll have one RDP per project.

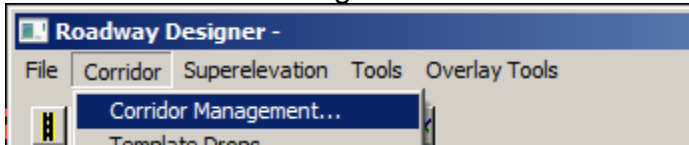
## Roadway Designer – Main Window Overview

Steps to create Corridors and Process Templates are described in the next section but some of the main functions of the primary Window are shown in the image below. You can edit specific stations, temporarily display dimension lines, change the display properties of the windows view XS, Plan, & Profile View, choose the contour you wish to view, etc.

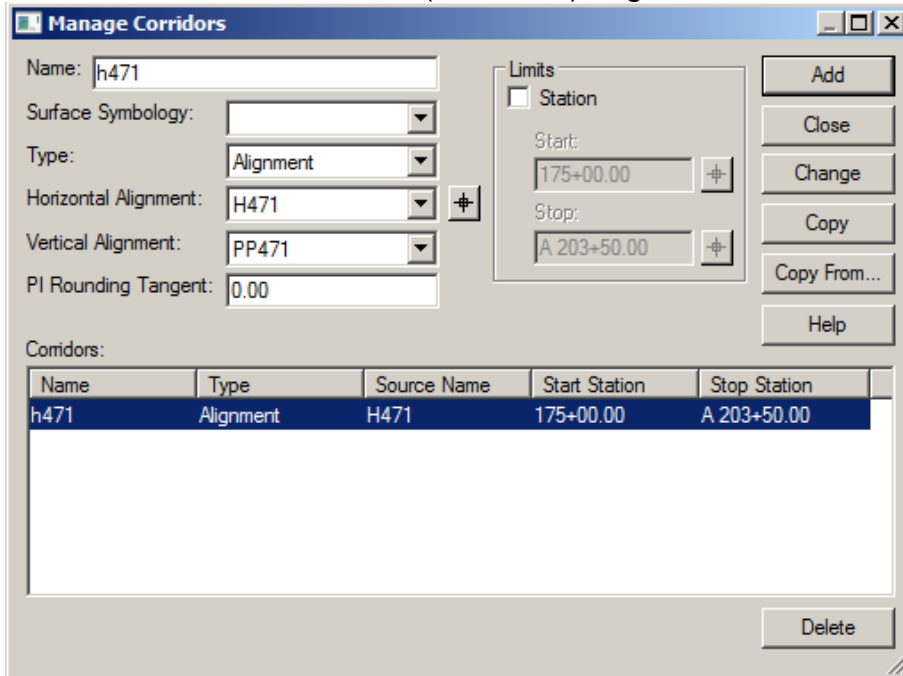


# STEPS – Roadway Designer - ML

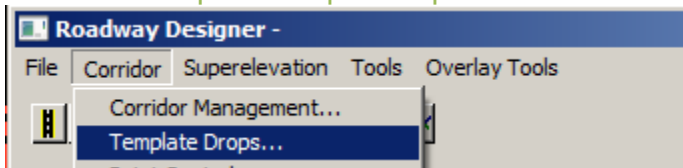
1. **Create a Corridor** - Tag Corridor -> Corridor Management

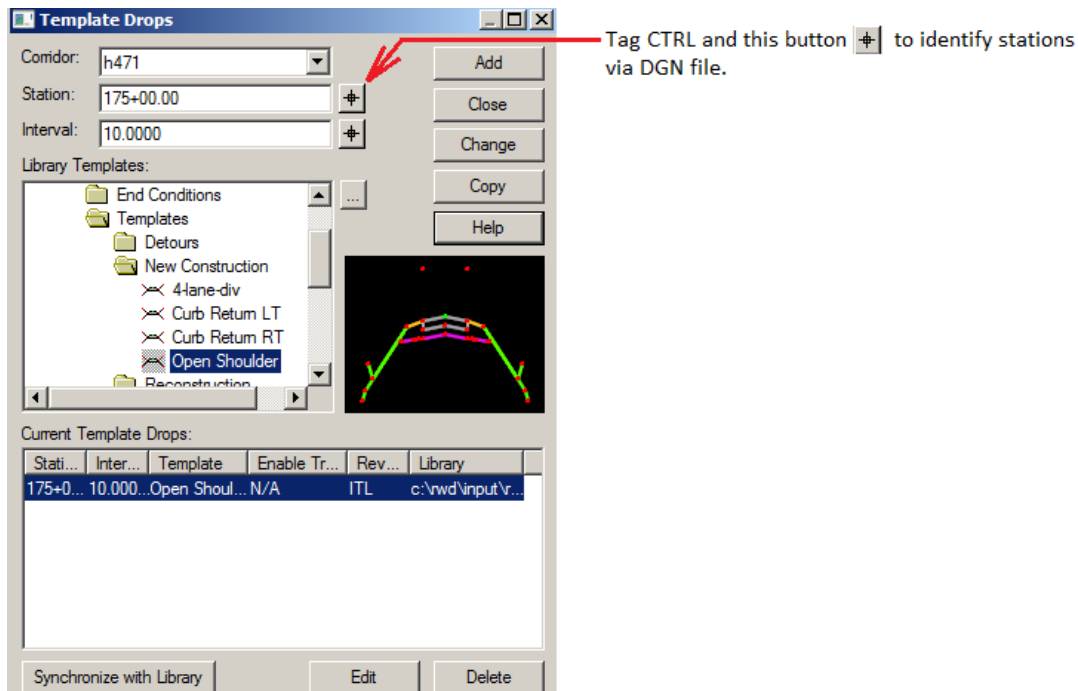


Enter a name for the corridor (The route), tag add, and then close.

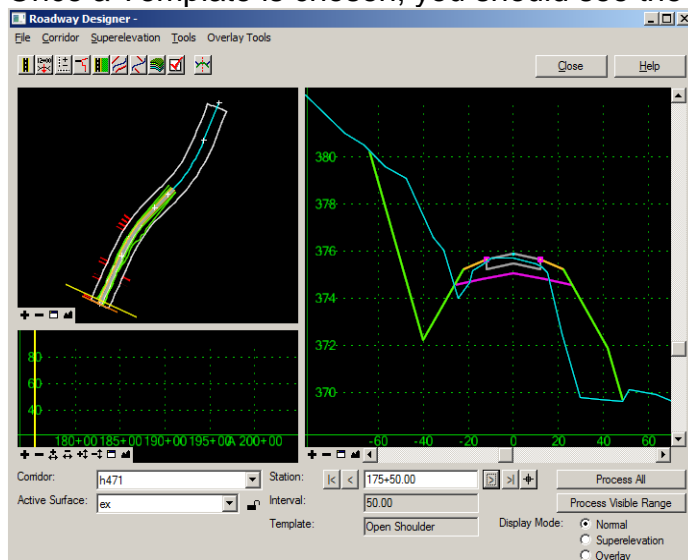


2. **Choose a Template.** Choose the template and tag Add. See Template Building Help for Building your own templates. See [Detour](#), [Intersection Design](#), etc. [Help for other Template Drop examples.](#)





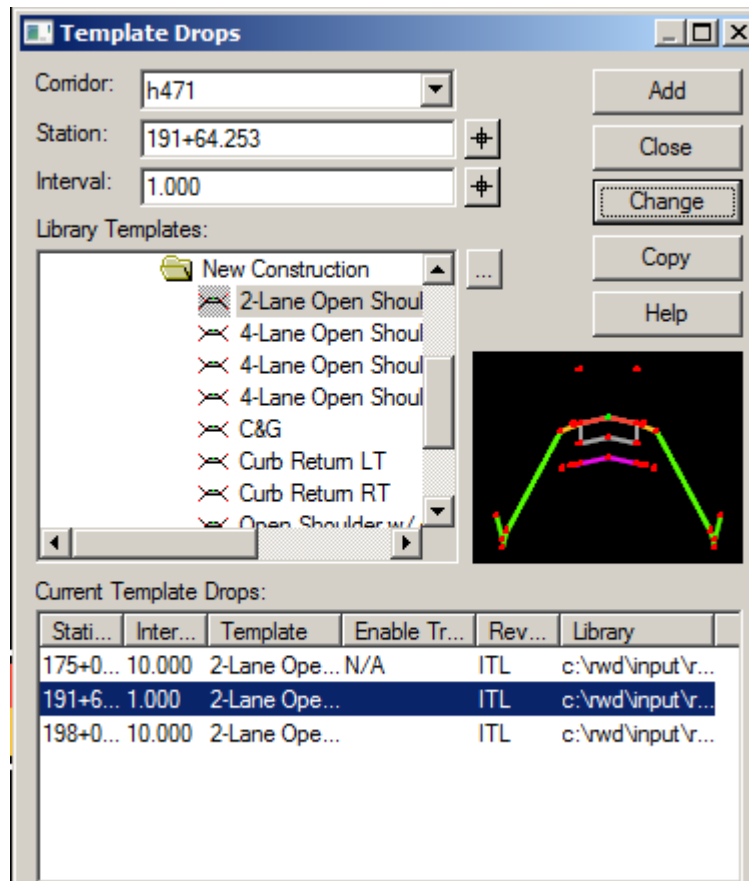
Once a Template is chosen, you should see the template as shown below.



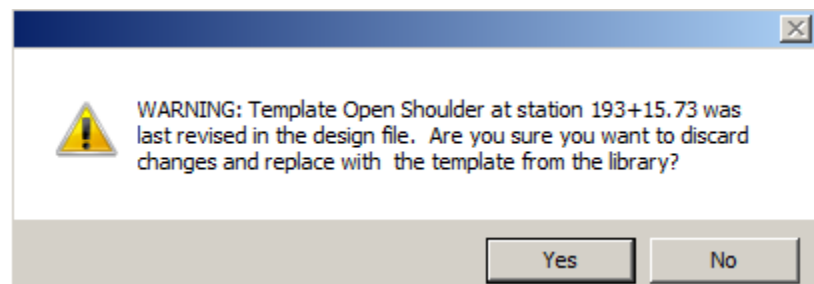
**Note:** More specific examples of the Template Drop dialog are provided in specific Template Help but this dialog allows you to specify different Templates for different Station Ranges, specify the interval of template drops, edit specific templates for the specified station range, and lets you know whether a template has been modified by the colors described below.

**Red** station text indicates the geometry of an alignment has been modified and the station value is no longer valid. **Red** template text indicates the template has been modified and is different from what is stored in the template library (.itl). A **red** template library (.itl) indicates the template library from which the template was placed is not the template library currently open. **Blue** template text indicates the template does not exist in the template library.

Generally you'll need Template drops at 10 or 20' intervals with closer intervals (1') in detailed areas (Intersections, etc.)

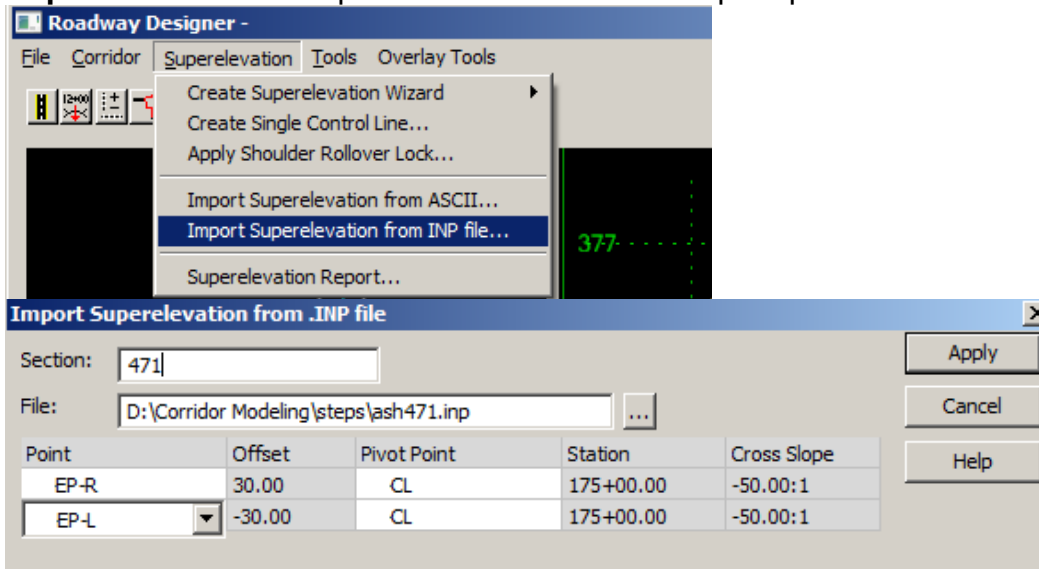


Generally if a Template is Red, you want to tag Synchronize with Library. If you have actually edited the template here by double clicking the template drop instead of in the Library, you will receive the following message when you try to synchronize. You would want to tag NO because you made changes to the template specific to the template run.



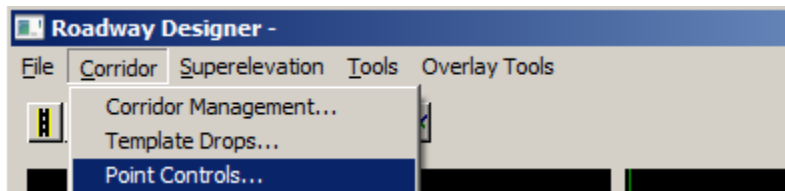


### 3. Superelevation – Is imported from a GeoPak Shape Input file.

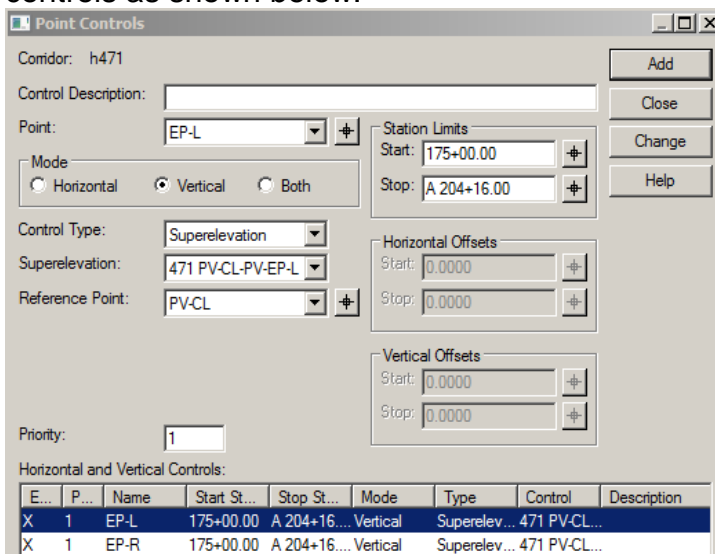


Note: You have to choose the Point, enter a section name, and then tag Apply.

### 4. Point Controls –

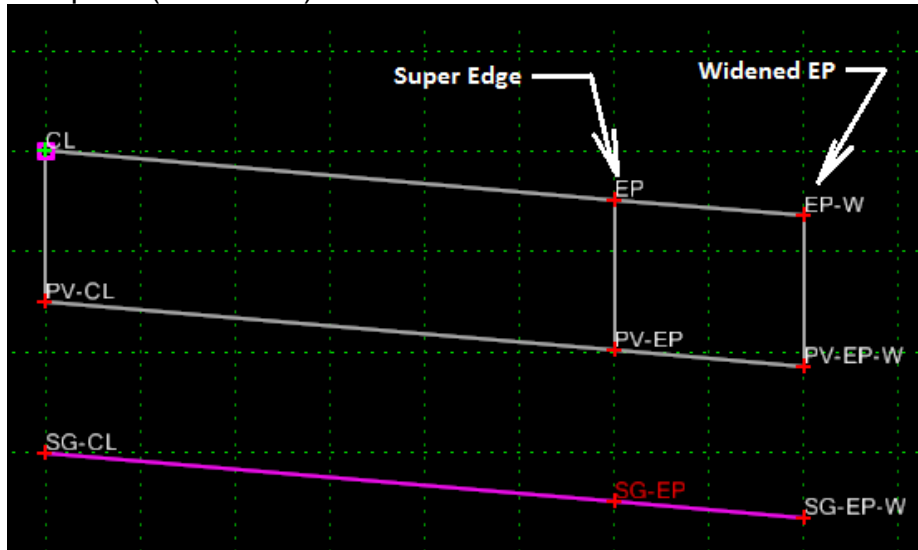


Point Controls allow you to tie points on the template with Alignments (actual Alignments, EP, etc.), Profiles, other Corridor Points, and Superelevation. See [Detour, 4-Lane, etc. Help for other Point Control examples](#) but MDOT will generally have point controls for EP\* & EP-W\* for 2-lane Roadways. The Superelevation imported in the previous step created Superelevation point controls as shown below.



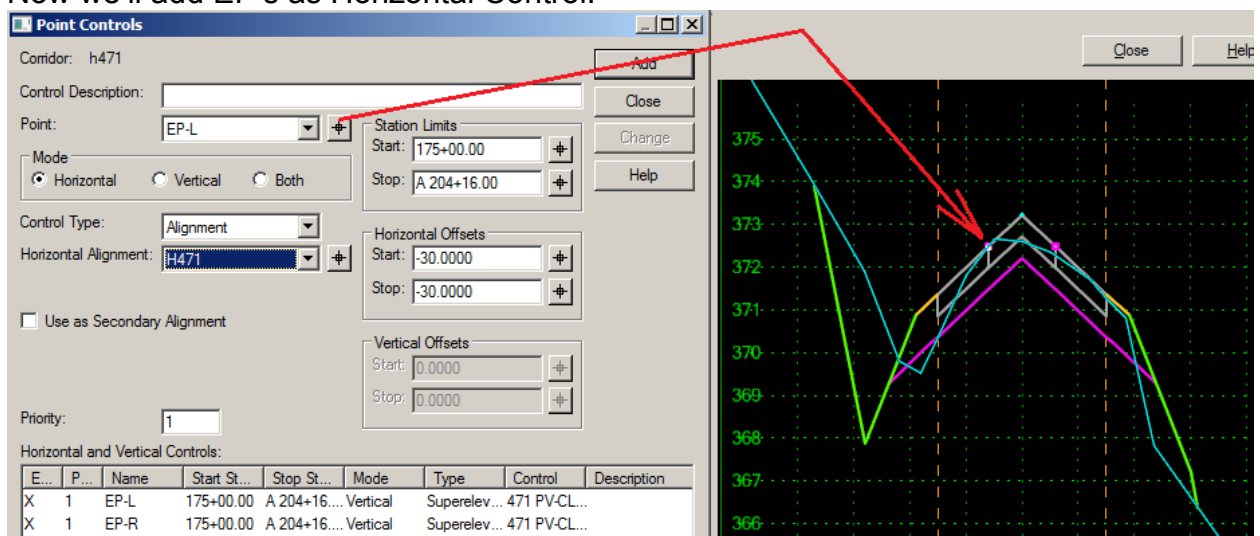
It is already built in the templates via Style Constraints that Shoulder, Paved Shoulder, Face of Gutter of Island, Ex EP, Clear Zone (At Transition areas), and Sidewalk on Curb Sections is drawn to automatically but if you want to define profiles for these alignments, you must add them as point controls.

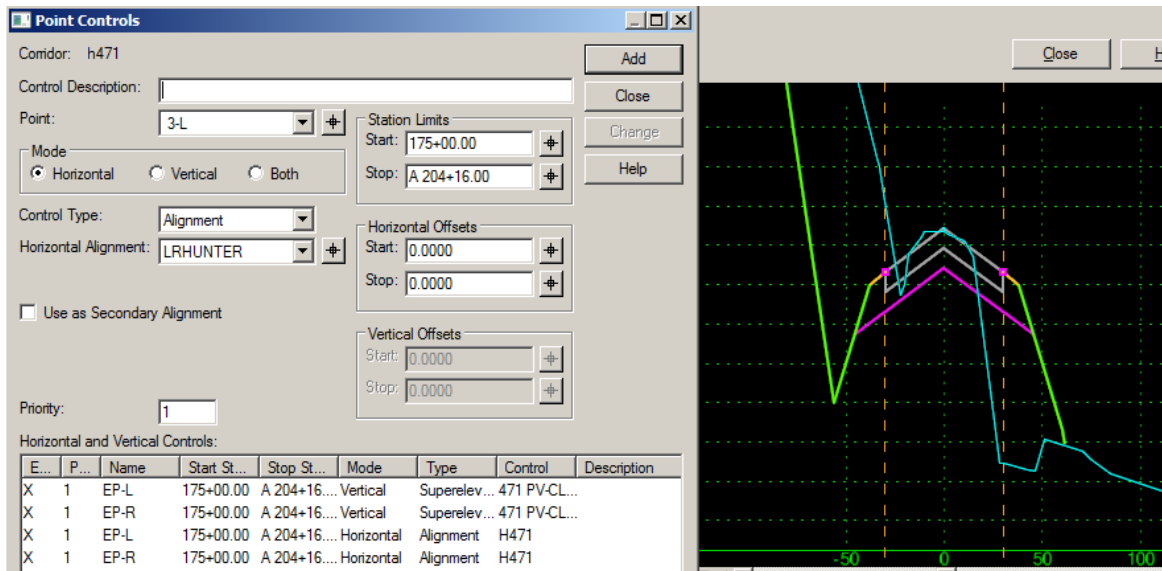
### Template (Pavement) Point Controls



EP-L & EP-R represent the normal EP (Superelevation edge) so you need to define these as Horizontal Alignments with Horizontal Offset if it is different than 12' since the Template is built with 12' lanes.

Now we'll add EP's as Horizontal Control.





PV-EP-W-L & PV-EP-W-R represent the widened pavement area outside the normal Pavement edge. These need to be tied to your Plan View EP's you imported for each chain. This widened pavement is set up to be drawn at the same slope as from CL to EP. You can also control the slope of this widened pavement with a Parametric Constraint called Widened Pavement Slope-RT or -LT. You may want to do this for any widening on the high side of a curve. Parametric Constraints are discussed more below.

Corridor: h471

Control Description:

Point:

Mode  
☒ Horizontal ☐ Vertical ☐ Both

Control Type:

Horizontal Alignment:

☐ Use as Secondary Alignment

Priority:

Station Limits  
 Start:    
 Stop:

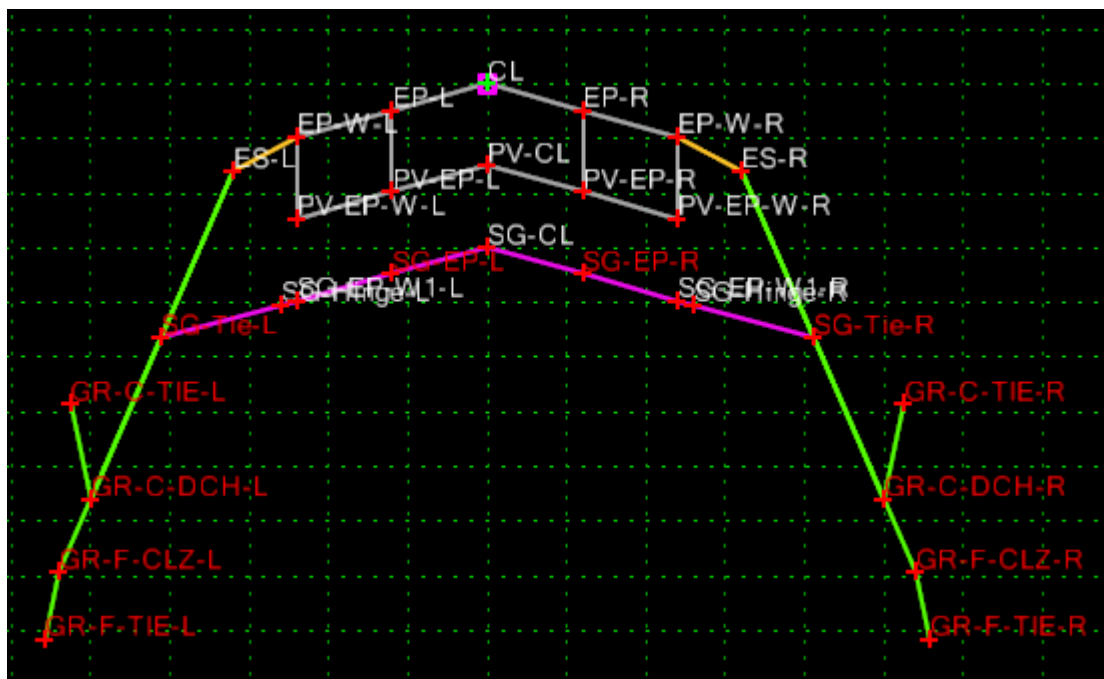
Horizontal Offsets  
 Start:    
 Stop:

Vertical Offsets  
 Start:    
 Stop:

Horizontal and Vertical Controls:

E...	P...	Name	Start St...	Stop St...	Mode	Type	Control	Description
X	1	EP-L	175+00.00...	A 204+16....	Horizontal	Alignment	H471	
X	1	EP-R	175+00.00...	A 204+16....	Horizontal	Alignment	H471	
X	1	EP-R	175+00.00...	A 204+16....	Vertical	Superelev...	471 CL-EP...	
X	1	EP-L	175+00.00...	A 204+16....	Vertical	Superelev...	471 CL-EP...	
X	1	EP-W-L	175+00.00...	A 203+50....	Horizontal	Alignment	ep-l	
X	1	EP-W-R	175+00.00...	A 203+50....	Horizontal	Alignment	ep-r	

Standard Template Points (See Template Building Chapter for more details.)



5. END Condition Exceptions – You add End Condition exceptions through intersections which will remove the proposed ground and shoulders through the intersection. Curb Returns will be drawn via their own Corridors.

**End Condition Exceptions**

Corridor: h471

Description:

Station Range

Start:

Stop:

☐ Backbone Only

Apply To

☒ Left Override

☐ Right Override

☐ Left Transition

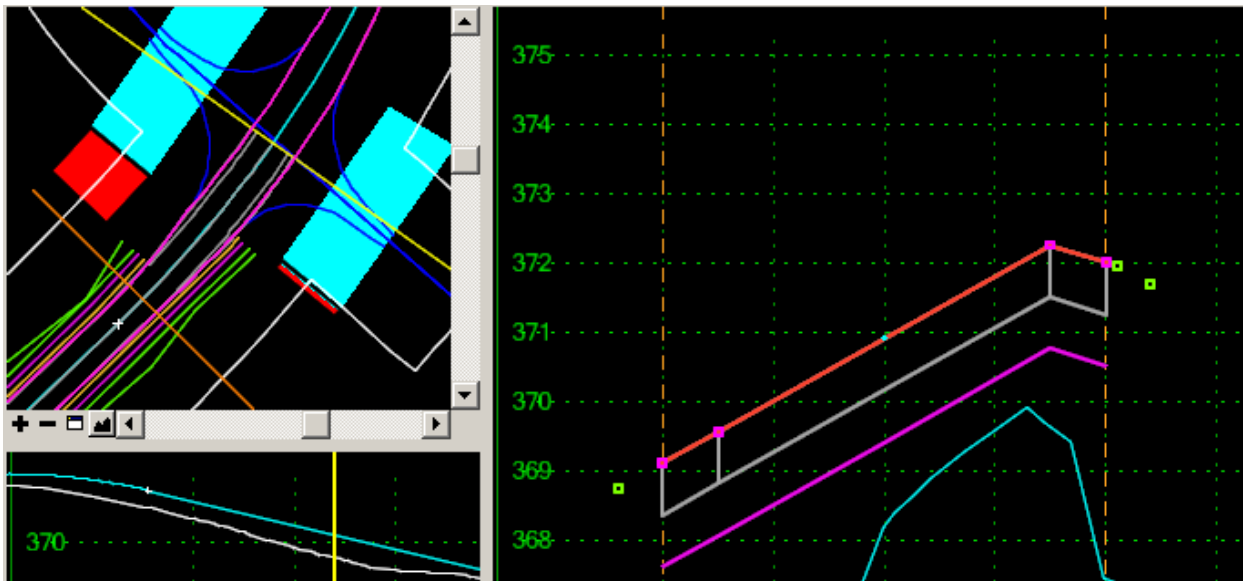
☐ Right Transition

Buttons: Add, Close, Change, Help

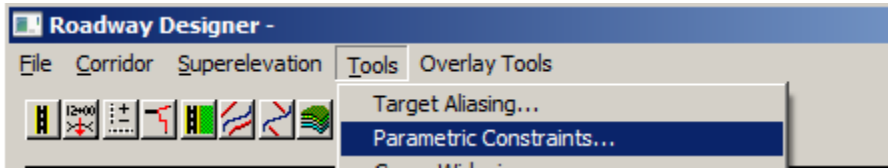
End Condition Exceptions:

Enabled	Start Station	Stop Station	Type	Description
X	193+15.730	196+55.522	Left Override	
X	193+43.000	196+22.771	Right Override	

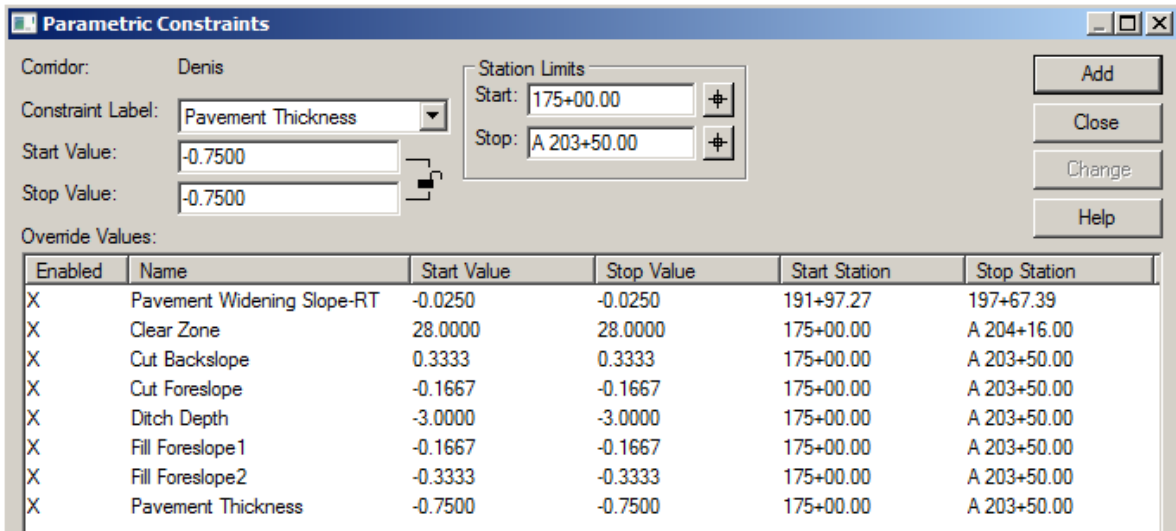
Buttons: Edit..., Delete



## 6. Parametric Constraints (Define Variables) –



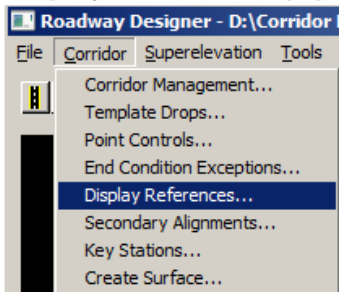
This is where you define variables for Pavement Thickness, Foreslope, Ditch Depth, etc. Choose the constraint label and change the Start/Stop Values and then tag Add for each Constraint.



Note that the Pavement Widening Slope-RT is controlling the widened pavement slope on the high side of a curve through a specific station range (Generally through an intersection).



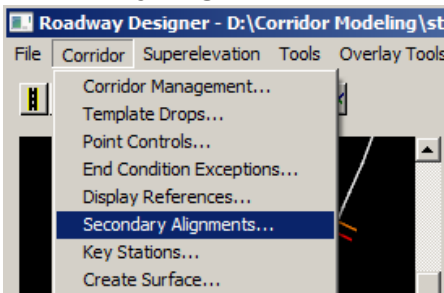
## 7. Display References (Optional Setting)



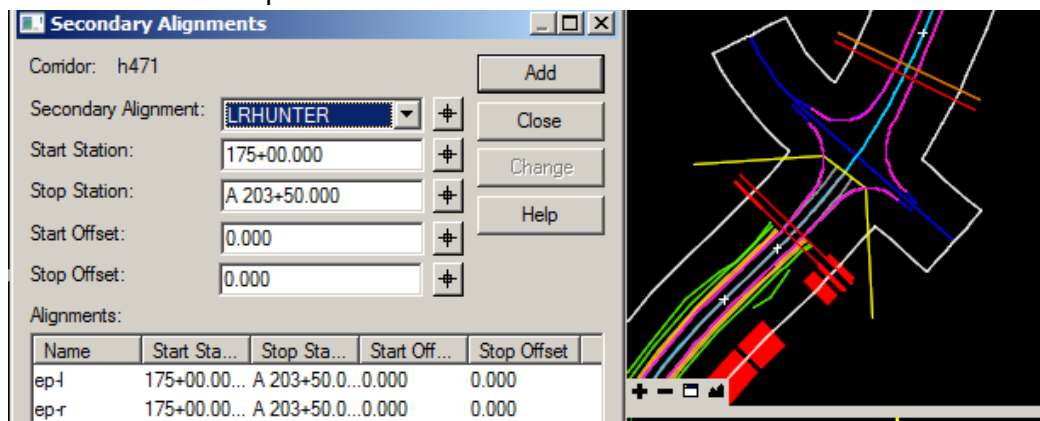
Allows you to see Alignments (actual alignments, EP, etc.) in the Plan & X-Section View.



## 8. Secondary Alignments (Req'd. Setting)

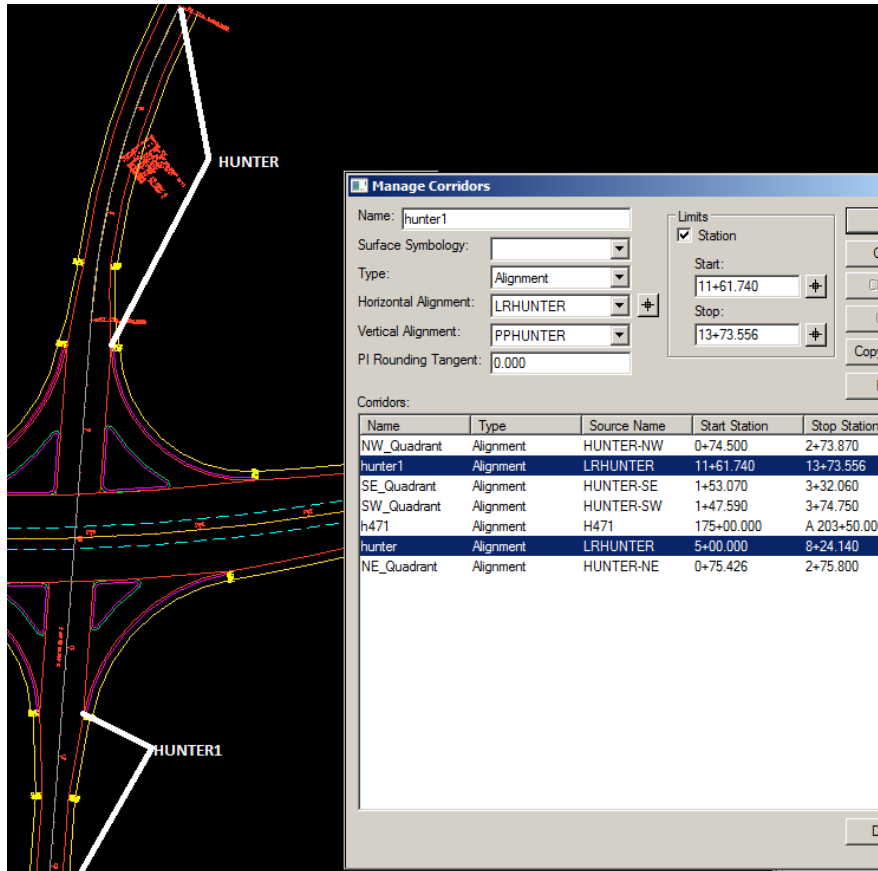


Alignments used to change the direction of x-section processing. See the yellow x-section line below. Note: Generally EP but basically the 1<sup>st</sup> plan view element intersected and not parallel to the ML.



## **STEPS – Roadway Designer - LR**

9. Create 2 Corridors for each local rd. with the station range as shown below:



10. Go through the steps as described when running the ML for each local rd. corridor.

## **STEPS – Roadway Designer – Curb Returns**

11. Create Corridors for each Curb Return and go through steps as described in ML steps above. Point Controls target the ML & LR Corridors as shown below and the Local Road EP is used as a Secondary alignment as shown below.



Name: NW\_Quadrant

Surface Symbology:

Type: Alignment

Horizontal Alignment: HUNTER-NW

Vertical Alignment: HUNTER-NW

PI Rounding Tangent: 0.000

Limits

☒ Station

Start: 0+74.500

Stop: 2+73.870

Add

Close

Change

Copy

Copy From...

Help

Corridors:

Name	Type	Source Name	Start Station	Stop Station
NW_Quadrant	Alignment	HUNTER-NW	0+74.500	2+73.870
hunter1	Alignment	LRHUNTER	11+61.740	13+73.556
SE_Quadrant	Alignment	HUNTER-SE	1+53.070	3+32.060
SW_Quadrant	Alignment	HUNTER-SW	1+47.590	3+74.750
h471	Alignment	H471	175+00.000	A 203+50.000
hunter	Alignment	LRHUNTER	5+00.000	8+24.140
NE_Quadrant	Alignment	HUNTER-NE	0+75.426	2+75.800

Point Controls – Edge-Locator targets the ML & LR Corridors

Corridor: NW\_Quadrant

Control Description:

Point: Edge-Locator

Mode

☐ Horizontal ☐ Vertical ☒ Both

Control Type: Corridor Point

Corridor: h471

Reference Point: EP-W-L

Station Limits

Start: 1+69.568

Stop: 2+73.871

Horizontal Offsets

Start: 0.000

Stop: 0.000

Vertical Offsets

Start: 0.000

Stop: 0.000

Priority: 1

Horizontal and Vertical Controls:

E...	P...	Name	Start St...	Stop St...	Mode	Type	Control	Description
X	1	Edge-Loc...	1+69.568	2+73.871	Both	Corridor Point	h471:EP-W-L	
X	1	Edge-Loc...	0+74.500	1+69.568	Both	Alignment	LRHUNTER:PPHUNTE...	

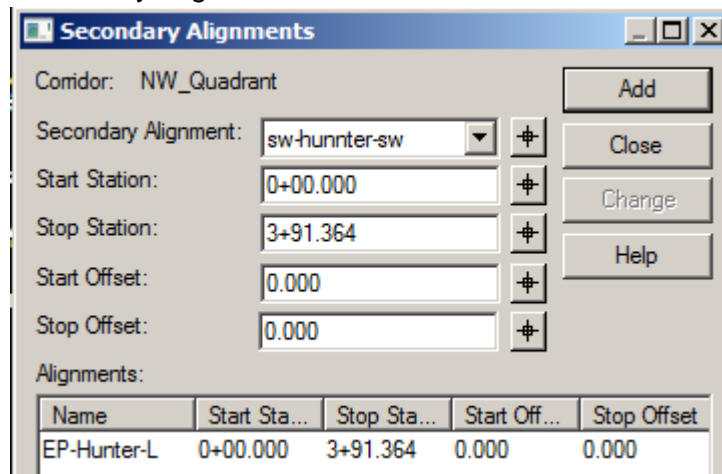
Add

Close

Change

Help

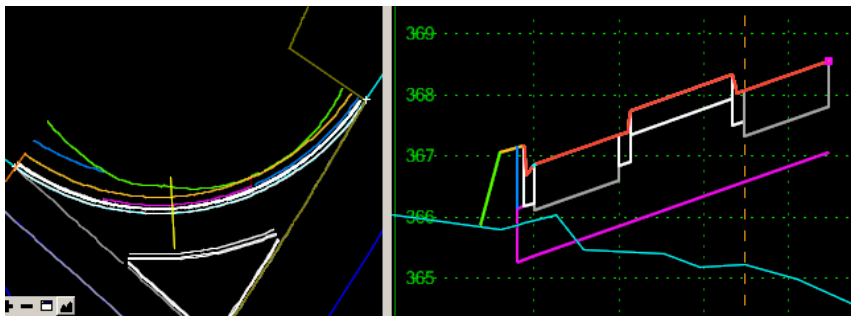
## Secondary Alignments



The 'Secondary Alignments' dialog box is shown. It has a title bar with standard window controls. The 'Corridor' is set to 'NW\_Quadrant'. The 'Secondary Alignment' is a dropdown menu showing 'sw-hunter-sw'. There are input fields for 'Start Station' (0+00.000), 'Stop Station' (3+91.364), 'Start Offset' (0.000), and 'Stop Offset' (0.000). To the right of these fields are small square icons with a crosshair. On the right side of the dialog are buttons for 'Add', 'Close', 'Change', and 'Help'. At the bottom, there is a table titled 'Alignments:'.

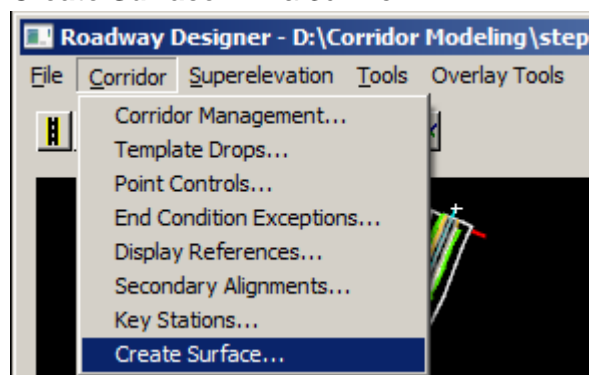
Name	Start Sta...	Stop Sta...	Start Off...	Stop Offset
EP-Hunter-L	0+00.000	3+91.364	0.000	0.000

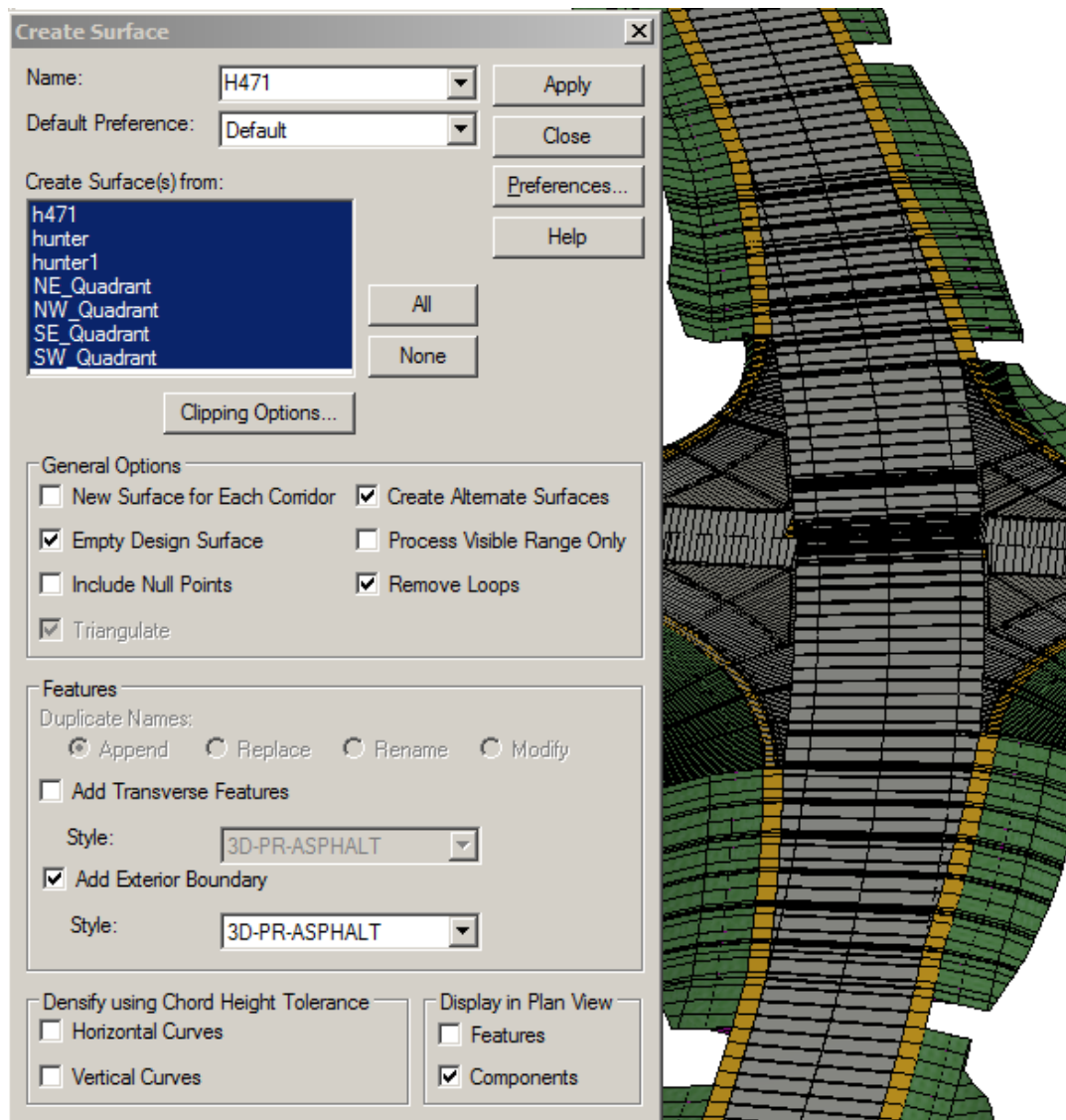
Template Created – Draws Island if intersected.



## STEPS – Roadway Designer – Creating DTM

### 12. Create Surface – In a 3d File.





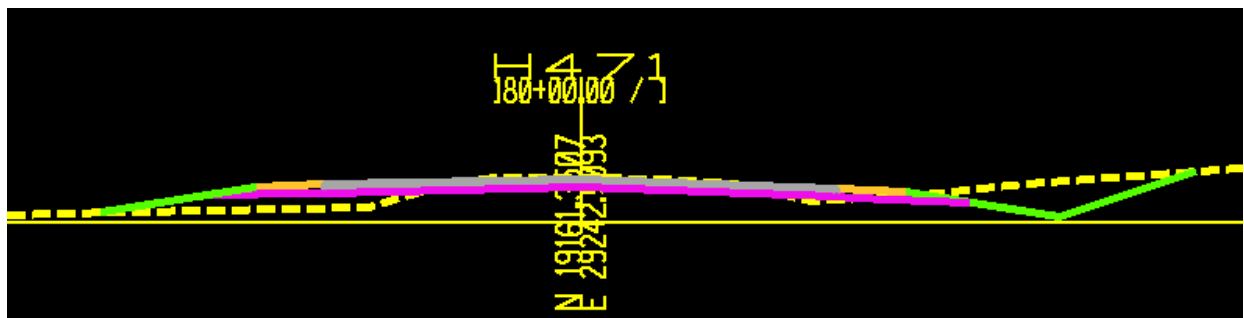
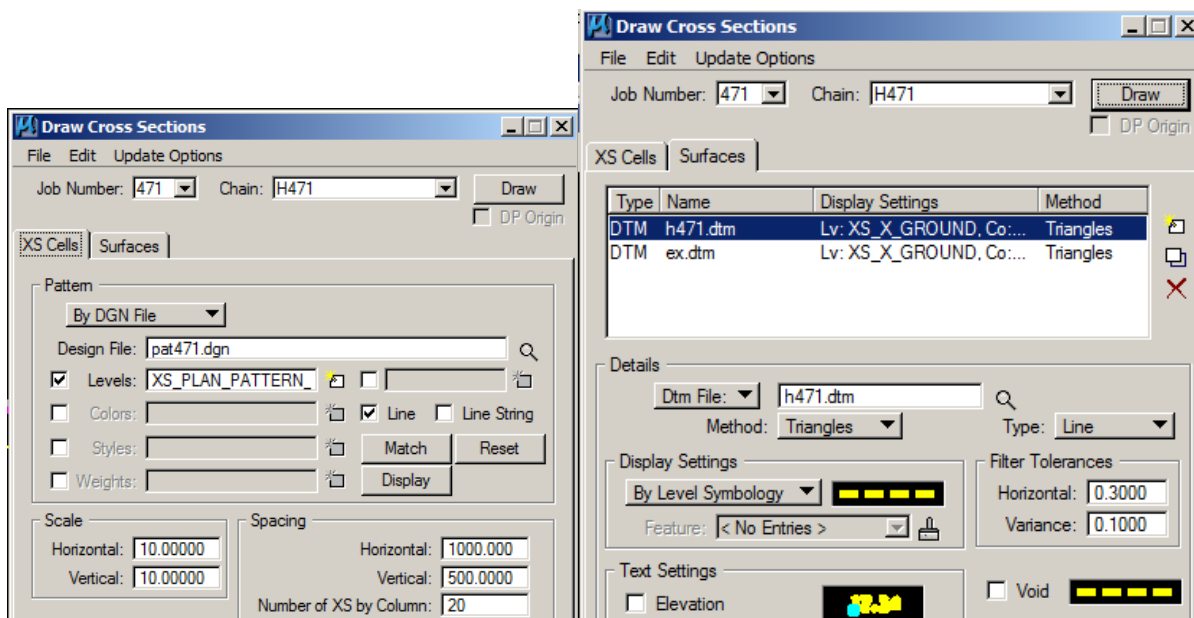
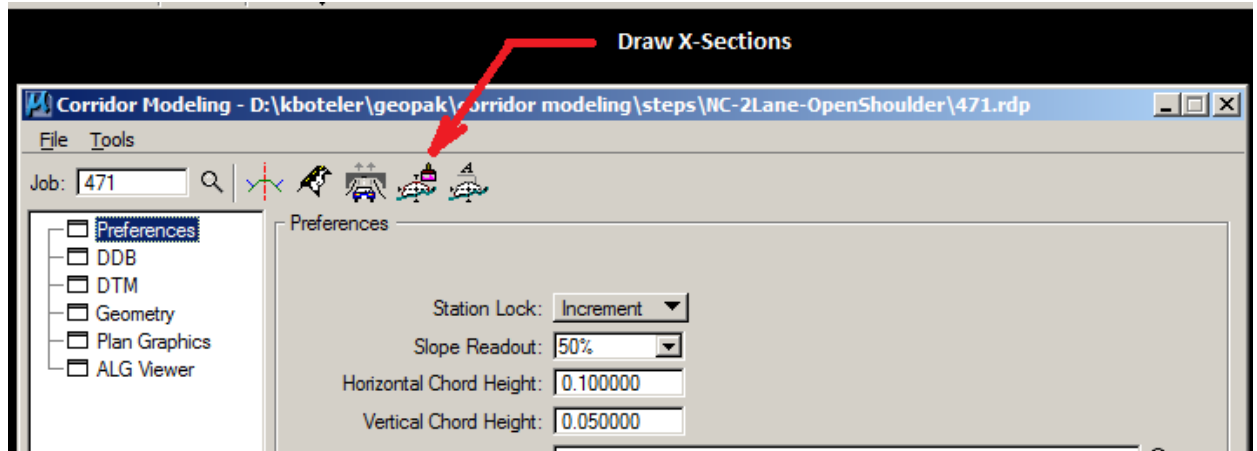
#### Notes:

- Notice the Corridors selected which will be clipped.
- Corridors are clipped as shown in the model above if you target a Corridor through Point Controls or Target Aliasing.
- An Inroads DTM is created by the step above (EX. H471.dtm)
- Also created is a “Top Dirt.dtm” which represents the earthwork grading layer.

13. **Save \*.IRD** – In Roadway Designer, tag File-> Save to save an IRD which saves the settings in Roadway Designer. Generally, you’ll have one IRD for one project.

# STEPS – Roadway Designer – XS's & EW

14. **Extracting X-Sections** – Create A XS DGN file and follow the example steps below.



**11) Earthwork** – An earthwork file called earthwk-corridor-xs.inp has been created to run earthwork on XS's created from DTM surfaces created by Roadway Designer. Tolerance has been adjusted to handle cases where the proposed ground does not tie to existing ground exactly because of skewed sections or sections cut where there is no section in Roadway Designer.